

REMARKS

The Office Action mailed 12 November 2008 and the Notice of Panel Decision from Pre-Appeal Brief Review mailed 12 June 2009 have been received and their contents carefully noted. Claims 1-6, 11-18 and 20-29 were pending and rejected. By this Response, claims 1, 25, and 26 have been amended and claims 30 and 31 have been added. Support may be found in the specification and claims as originally filed. See, for example, pages 18-19 and Table 2 of the specification. Reconsideration in view of claim amendments and the following is respectfully requested.

Rejection under 35 U.S.C. 103(a)

The Examiner maintained the rejection of claims 1-6, 11-18 and 20-29 as being unpatentable over Zimmerman (US 5,849,176) in view of Reed (US 5,656,150).

Applicants respectfully submit that claim 1, as amended, discloses a process for reducing the coking on the metal walls of a reactor and heat exchanger comprising a pretreatment step, a cracking step and a decoking step. The pretreatment step is carried out in steam with at least one non-sulphur-containing silicon compound which is hexamethyldisiloxane and at least one non-silicon-containing sulphur compound which is dimethyldisulfide. Pretreatment is carried out at a temperature between 300 and 1100°C for 0.5 to 12 hours. The Si:S atomic ratio is between 2:1 and 1:2 and the concentration of silicon is less than 500 ppm. In the cracking step, a feedstock of hydrocarbons or other organic compounds in the reactor and heat exchanger are cracked. Further, a decoking step comprising a mixture of air and steam is used to decoke the reactor and heat exchanger.

Zimmerman discloses a process for decoking reactors wherein metal samples are thermally pretreated with tri-methyl-silyl-methyl-mercaptan (TMSMM). See Examples 5-10. Zimmerman uses a mixture of hydrogen and methane during pretreatment. See col. 5, ll. 51-53. Zimmerman discloses dimethyldisulfide (DMS) added to the cracking feed. However, the pretreatment step fails to disclose steam with a mixture of at least one non-sulphur-containing silicon compound which is hexamethyldisiloxane and at least one non-silicon-containing sulphur compound which is dimethyldisulfide.

Reed discloses a method to pretreat radiant tubes with steam and an antifoulant

composition comprising hexamethyldisiloxane. Reed does not disclose a pretreatment step with a stream of steam comprising both hexamethyldisiloxane and dimethyldisulfide.

Applicants have surprisingly found that a pretreatment stream comprising steam with a mixture of a non-silicon containing sulphur compound and a non-sulphur containing silicon compound significantly reduces the formation of coke on metal walls of reactors. See pg. 5 of the instant specification. Applicants have tested the coke inhibition properties of their pretreatment stream through 6 cracking/decoking cycles. See new claim 30 and Table 2. Specifically, the coke inhibition rate ranges between 66% and 36% through 6 cracking/decoking cycles. See claim 25. In view of Zimmerman, “coke deposits accelerate after each decoking run and thus, operation periods between decokings grow shorter as the number of decoking cycles increase”. See Zimmerman col. 1, ll. 35-40. Nowhere do Zimmerman and Reed teach or suggest that pretreating metal walls with steam and a mixture of a non-silicon containing sulphur compound and a non-sulphur containing silicon compound will significantly reduce the formation of coke through multiple cracking and decoking cycles.

In addition, Applicants respectfully submit that the Office Action’s characterization of the phrase, “[i]n place of compounds that simultaneously contain both silicon and sulfur, mixtures of silicon compounds and sulfur compounds also attain the same effect as coke formation inhibitors” at col. 6, ll. 52-57 is inaccurate with respect to Applicants’ pretreatment step. The recited silicon and sulfur compounds in Zimmerman are added to the n-heptane during cracking. See col. 6, ll. 49-51. Thus, Zimmerman fails to provide the guidance necessary to select at least one non-sulphur-containing silicon compound which is hexamethyldisiloxane and at least one non-silicon-containing sulphur compound which is dimethyldisulfide for use in a pretreatment step. Because Reed fails to remedy Zimmerman’s deficiency, one of ordinary skill in the art could not have combined the cited prior art in order to arrive at Applicants’ claimed invention. Thus, the present invention, as claimed is novel and unobvious.

Therefore, the rejection under 35 U.S.C. 103(a) should properly be withdrawn.

Request for Interview

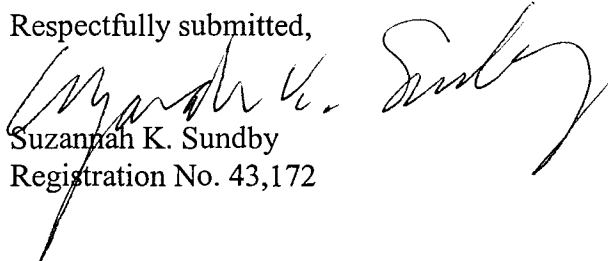
Applicants respectfully request that the Examiner contact the undersigned to arrange a personal interview prior to further action.

CONCLUSION

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Therefore, it is respectfully requested that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Official action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

It is not believed that extensions of time are required, beyond those that may otherwise be provided for in accompanying documents. However, in the event that additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. 1.136(a), and any fees required therefor are hereby authorized to be charged to **Deposit Account No. 024300**, Attorney Docket No. **033808.172**.

Respectfully submitted,


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